TO EASE THE BURDEN
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TO FIND THE CURE

AQUATIC EXERCISES FOR PARKINSON'S DISEASE

A Guide for Patients and Their Families

The American Parkinson Disease Association, Inc.

THE AMERICAN PARKINSON DISEASE ASSOCIATION, INC.

PARKINSON'S DISEASE AQUATIC EXERCISES

A SUGGESTED EXERCISE PROGRAM FOR PEOPLE WITH PARKINSON'S DISEASE

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I. INTRODUCTION

Water therapy is an ancient and time honored form of healing. The Greek, Roman, and Persian healers of the Middle Ages, as well as our native Americans, all benefited from the healing properties of water in the form of medical treatment. Traditionally, warm springs and mineral waters have been considered by humankind as special neutral areas, even in times of war and strife. The spiritual benefits of water include the sounds of laughter, the sensations of relaxation, and the prevailing attitudes of playfulness.

The scientific benefits of water are many but include most noticeably; buoyancy, resistance, hydrostatic pressure, flow motion, and thermal energy transfer. A large body of research is available from NASA on the effects of total body immersion. Most of the early space research into the effects of weightlessness on humans was carried on under water. The reader is referred to the reference list for further information on aquatic research and the biophysiological aspects of water.

Water is an excellent exercise medium for anyone with the diagnosis of Parkinson's disease (PD). The buoyancy effect of water on the human body creates a feeling of easy movements and freedom. Water helps *"To ease the burden"* of moving and is a joy to patients and a continuing source of great satisfaction for all therapists.

II. BENEFITS OF AQUATIC EXERCISE AND PARKINSON'S DISEASE (PD)

The benefits of exercise in maintaining overall health have long been established. Aquatic programs for PD build on these benefits and focus on the specific problems that PD can cause.

An exercise program for PD should include the following areas:

- ☑ Functional training for activities used in daily living including voice and facial expressions
- ☑ Range of motion
- ☑ Strengthening
- ☑ Flexibility
- ☑ Balance training
- ☑ Coordination
- ☑ Aerobic training
- ☑ Postural training
- ☑ ***FUN***

By being in the water the patient will experience all of the benefits of land exercise plus the following added advantages presented by an aquatic environment:

- ☑ Water assists movement freedom, thereby promoting range of motion and increasing functional strength.
- ☑ Exercising in warm water provides a thermal effect which may alter muscle tone and reduce pain.
- ☑ Warm water provides a soothing effect and an increased tolerance for exercise.
- ☑ The gentleness of the water allows muscles to relax, lengthen, and reduces stiffness.
- ☑ The buoyancy or weightlessness which occurs in water, combined with the resistance, created by movement in water, helps improve muscular strength and endurance, particularly, in a person weakened by lack of exercise.

- ☑ Moving body parts through water generates body awareness that enhances better posture. The continual adjustment to the dynamic water environment heightens body awareness that may enhance motor control during walking.

- ☑ Water slows movement, allowing response time, and provides sensory feedback, this may enhance motor control during walking. Water is a safe environment to challenge balance with supervision.

- ☑ Aquatic exercise participants have reported improved bowel frequency. This is relevant to the PD patients since they have a higher than average occurrence of constipation.

- ☑ Aquatic exercise decreases isolation and depression.

- ☑ Aquatic exercise creates an overall feeling of well-being.

III. WHAT TO LOOK FOR IN A POOL FACILITY

Most states have established over the years various codes regulating aquatic facilities. These are referred to in general as the **"State Bathing Code"** and can be obtained from state or county boards of health. Regulations vary from state to state, but all include minimum standards for physical and plant sites. maintenance room equipment, water sanitizing materials, and safety procedures for swimmers and pool personnel.

In addition, various federal statutes also relate to pool safety. A list of organizations and helpful Web sites relating to aquatics can be found at the end of this protocol.

Safety and Hygiene checklist:

- ☑ A state or county board of health rating should be posted monthly for the public to view. This rating will list any problems and give a total score on the facility.
- ☑ Adequate numbers of rest rooms and showers.
- ☑ Assisted dressing rooms where a family member or friend can assist someone dressing and undressing.
- ☑ Nonskid floor surfaces in dressing areas and in pool area.
- ☑ Certified pool operators.
- ☑ Certified life guards on duty.
- ☑ Meet Americans with Disabilities Act (ADA) regulations and codes.
- ☑ Be accessible by steps with a hand rail or a ramp with a hand rail, or by a pool-chair lift.

IV. AQUATIC SAFETY ISSUES SPECIFIC TO THE PD PATIENT

General precautions: Any participant should seek medical advice before beginning an aquatic program. Most programs will require a medical release form. All PD clients should have their physician's permission before beginning any exercise program.

Getting in the pool: Initiation to the pool may be stressful at first and cause an acute attack of PD symptoms. Being in a new environment, stripping down to your skivvies, meeting new people half naked, and not knowing what to expect can all be stressful. Do not be surprised if you notice increased rigidity or slowness during the first class or two.A calm and knowledgeable instructor will be able to move you quickly through this phase and will soon have you relaxed and laughing.

Energy depletion: Many clients come to therapy in a very deconditioned state (this means you have not been doing any exercise of any kind-a couch potato). You may find it necessary to take an extra dose of levodopa/carbidopa following the therapy session. After consultation with your physician, it is recommended that all patients bring an extra dose of medicine with them to the pool. Even though you feel relaxed during and after the class, you are expending large amounts of energy while exercising. As an example, it takes 7 times more energy just to breath in neck deep water than it does on land. It is best to exit the pool slowly and check for any feelings of weakness, rigidity, or dizziness. If you are having these feelings, it is best to take a seat in the pool area and let your body readjust to being on land. Most pools require that clients be physically independent. Inquire about policies regarding attendants or assistance should you need additional help before joining a facility.

We have found that family members who are helpers and attendants enjoy the aquatics class as much (or possibly more than) our clients. Water is a wonderful stress-reducer.

Water Temperature: The PD medication you are on may have orthostatic hypotension (low blood pressure) as a drug side effect. In addition, the PD nervous system is prone to be fragile and more vulnerable to sudden or unexpected changes. Cool water temperature may cause a sudden drop in blood pressure leading to fainting. For this reason, water temperature is important to remember when engaging in water sports in lakes, rivers, and oceans. Both the water temperature and the amount of exercise you will be doing should be considered when choosing an aquatic environment. Water temperatures in pools will vary. As an example, a pool used primarily for competitive swim meets and training would be much cooler than a pool used for one on one therapy of disabled clients. A pool used for aquatic exercise is usually in the range of 82º - 86º F. As a comparison, a "hot tub" is generally kept at 105º F. and a one on one therapy pool is usually 92º - 98º F. When a pool is labeled as "heated", the temperature may still be too cool for the PD client. Our pool is maintained at 90º - 92º to facilitate muscle relaxation and to impart a soothing effect to reduce pain. This also reduces any risk of orthostatic hypotension.

The main consideration to remember is to not let yourself become "chilled" so that you are uncomfortable and stressed. "Chill bumps" and "shivering", even with

moderate exercise, are signs that the water is too cold. The aquatic experience should be relaxing and fun and of an adequate temperature to allow the maximum amount of energy to be focused on the exercises.

Your Skin: Before entering the pool be sure to check for any abrasions or cuts. It is best to use a water proof type bandage for these areas to prevent any chance for infection.

The aquatic facility will request that you shower before entering the pool.This is to remove any body oils or perspiration. After your aquatic exercise session it is a good idea to shower before leaving to remove the chlorine. Chlorine can be very drying to the skin. Only a quick rinse is necessary.

Balance instability: Poor balance (or postural instability) may lead to easy tipping over in the water. Flotation devices such as inner tubes, belts, noodles, and buoys do not solve this problem. Even a good swimmer with Parkinson's may have difficulty regaining footing (or standing posture) due to their disease and the buoyancy of the water. We strongly recommend, prior to joining a class, have your instructor test your water safety. This is to check out your floating and self righting skills prior to being placed in a group. Listed are some skills your instructor should review with you in waist to chest deep water:

- ☑ Water walking forward, backwards, and side step.
- ☑ Submerge your face and blow bubbles.
- ☑ Floating on your back and then come up to standing.
- ☑ Floating on your face and then come up to standing.

These tests will indicate the amount of assistance you will need in the water during the exercise program. It may be a good idea to have a friend accompany you during your first several visits to the aquatic class until your skills improve and you are at ease.

We also recommend using the "Functional Reach" test prior to beginning the class. This is assessment which is done on land and is an acceptable predictor of a person's risk for failing on land.

Aquatic instructors should explain to the prospective participant that the improved balance and ease of movement in water will not transfer to land. Remind members, especially members using walkers, not to be careless and to continue to use the walkers in the proper manner since their land balance may not change.

V. WHAT TO LOOK FOR IN AN AQUATIC PROGRAM

Aquatic therapy is traditionally defined as an individual client working on a one on one base with a therapist. This is usually very short term and reimbursed by third party payers (insurance). For more long term benefits, an aquatic exercise class may be more appropriate and affordable.Your local PD support group is a good source of information regarding the best opportunities in your community. If cost is a factor, the support group may want to negotiate with a local facility to provide aquatics classes for a group of PD clients at a reduced rate. Insurance will often pay for a limited amount of individual therapy and may even pay for group sessions if viewed as wellness activities or as health promotion. Local YMCA's, health spas, universities, and recreation centers may have general aquatic exercise classes that can be of benefit.

QUALIFICATIONS OF AQUATIC THERAPISTS/INSTRUCTORS:

Aquatic therapy is a part of physical and rehabilitative medicine. Aquatic instructors may have a variety of qualifications. This profession is currently under development and credentials vary from state to state. Absolute minimum qualifications for the aquatic instructor are: community water safety training, basic first aid, and cardiopulmonary resuscitation.

The Aquatic Therapy and Rehabilitation Institute (ATRI) has certification procedures and is working to establish credentials and continuing education programs for Aquatic Therapists. The Aquatic Exercise Association (AEA) has established certifications for aquatics instructors and pool specialists.The Arthritis Foundation certifies aquatic instructors for their AFYAP (Arthritis Foundation YMCA Aquatic Program) programs. The National Multiple Sclerosis Society certifies aquatic instructors for their Making A Splash With Multiple Sclerosis program.

VI. TIPS FOR THE NEW AQUATIC PARTICIPANT

☑ Wear your swimsuit under your clothes to class to save time and energy dressing and undressing. Bring dry clothes to change into after class.

☑ Wear aqua socks or shoes while in the pool and shower areas. This will protect your feet and provide additional aid against slipping.

☑ Look for a pool with stairs and railings or with a ramp if you can not climb in and out using a pool ladder. Many pools are equipped with a chair lift for easy entry and exit.

☑ If you use medication on an "as needed" basis, bring additional medication with you in case you should need it.

☑ Make an appointment with your aquatic instructor prior to class to acquaint yourself with the instructor as well as the building and available parking. You need to know where to locate locker rooms and rest rooms or if assisted dressing rooms are available should you need help. Ask about their policy should you need an assistant while in the pool. Observe one of his/her classes.

☑ During your first classes start out slowly. You may need only to exercise for 15 minutes, especially if you are unaccustomed to exercise. Listen to your body. If you become tired Stop. Relax and enjoy the water. It's O.K. to take a break, matter of fact, your instructor prefers it.

☑ Do not force your body to make a movement that is uncomfortable for you. Perform exercises in a easy pain free way. We do not believe in the saying "No pain, No gain". We prefer "Pain is Insane"!

☑ Remember you feel much lighter and you can move easier in the water due to a gravity reduced environment. When you exit the pool walking and moving will require more strength due to gravity's return. This coupled with fatigue from exercising, can cause considerable weakness when first exiting the pool or may cause you to feel very heavy and leaden. Before walking back to the dressing room you may want to sit in a chair by the pool and give your body time to adjust to the change. Assess yourself, you may need more medication at this time.

☑ Stop if pain, dizziness, rigidity, or other problems occur and ask for assistance from your instructor or life guard.

☑ If you become chilled while in the pool you may want to invest in aqua fitness or aquatic therapy wear which is designed to keep you warm while in the pool. Aquatic wear can be ordered from swim wear suppliers.

☑ Bring a friend.You will encourage and help each other, plus you are more likely to stick with the program.

☑ Just how long has it been since your were last in a pool? If it has been a while or if you're just unsure of your present water safety skills ask your instructor or an aquatic specialist to give you an in-pool water skill evaluation. Though you probably will be exercising in waist deep water, you are still at risk.

VII. IMPORTANT NOTES FOR INSTRUCTORS

Keep your classes small (six - maximum of 12 participants). The potential for balance loss and submersion are compounded by the unpredictably of the symptoms of PD. The PD participants can experience changes in their ability to move quickly. The participants may not be aware of the changes until they are in over their head, so to speak. Realize, due to the PD symptom low voice volume, the participant may be unable to cry out for help.

Always have help with this class, someone to assist you with the class in the water as well as a life guard on the pool deck watching.

Always take the time to interview each member before enrolling them in your class. Review all the factors necessary for a successful experience with your program. Help problem solve with them, for arrangements for dressing and undressing, entering and exiting the pool. This may require the assistance of a family member or a friend.

Always take the time to do an in-pool assessment for pool safety with each potential member. Should a client require one on one assistance suggest having a friend or family member to help. We allow helpers in the class for free.

VIII. A SAMPLE BEGINNER EXERCISE PROGRAM FOR AN AQUATIC 30 MINUTE CLASS

A. Warm Up - Water Walking 8 -10 minutes:

Begin by having the class to walk forward, then backwards, and then side step, some class members may need to use a stabilization bar, or require a partner.

During this warm up time observe each member in your class. Note who is having a good or a bad day. Be prepared in your mind to offer alternate exercise suggestions which may be more appropriate to the individual.

B. Upper Body Exercises

Concentrate on shoulders and upper spine exercises to increase the range of motion. Some class members may need to have their backs against the pool wall for stabilization while some class members will progress to using hand buoys for added resistance and strength training. Remind participants to relax their hands and not squeeze the grips tightly when using hand buoys. PD client's hands tend to become rigid when grasping. Pause frequently, introduce hand exercises and allow hands time to relax.

1. Squat down with shoulders in the water. Coordinate some moves with deep breathing.

    a. Horizontal Arms Apart/Together- arms extended straight out in front of the body bring the arms apart with palms up and then arms together with palms down.

    b. Side Arms Raises - extended out to the sides, bring arms down to the sides with palms down and then bring arms up to the surface with palms up.

    c. Forward Arm Raises - arms extended straight out in front of the body push straight arms down toward the thighs with palms down and bring arms up to the surface with palms up.

    d. Overhead Reach - place hands on shoulders slowly reach overhead and bring hands back to shoulders.

    e. Arm Crossover - using a pendulum motion cross arms in front of body then swing arms behind the back, crossing them again. Class members which have their backs against the pool wall would cross their arms in front of the body at chest height and then swing arms across again lower in the water in front of hips and back up to chest height.

f. Shoulder Shrugs - lift shoulders to ear lobes and then relax shoulders. (Breathe in with the lift and exhale with an audible "Haaa" when relaxing the shoulders back down.)

C. Shoulder Stretch Exercises - Hold for 15-30 Seconds:

1. Triceps Stretch - Extend one arm up and behind you and give yourself a pat on the back.

2. Shoulder Stretch - Wrap arms around upper body and give yourself a hug.

3. Pectoral Stretch - Stand upright with knees slightly bent. Bring hands together behind the back and slowly lift hands toward the ceiling. Squeeze shoulder blades together.

D. Concentrate on Trunk Flexibility

Start without equipment for your first several classes. Over the next few weeks progress to using hand buoys and then kick boards. We also use kick boards to do exercises to challenge balance.

1. In waist deep water, knees bent slightly feet apart for a nice base of support, your best posture, knees and toes pointing forward:

    a. Trunk Rotation - Hold hand buoys extended arms out in front of body, twist at the waist from side to side. (If you are not using buoys, extend arms and place hands together palms facing.)

    b. Lateral Trunk Flexion - Hold hand buoys at the sides of the body, bend laterally, extend the buoy down toward the knee on one side of the body and then toward the knee on the other side of the body. (If you are not using buoys, extend one hand down the side toward the knee while the other hand slides up the side towards the shoulder. I call this zipping and unzipping two side zippers)

2. Pelvic Tilt - Squat in a chair like position with back against the pool wall. Slowly contract abdominals, bring gluteus under hips.

3. Hip Circles - Stand slightly away from the wall, place hands on hips and slowly make a circle with the hips. Circle in one direction several times and then circle in the other direction. (Like the hula-hula)

E. Stretch Exercise - Hold for 15-30 Seconds:

1. Spinal lengthening Stretch - Face the pool wall and hold to the edge for balance. Extend the right arm up over head, at the same time extend the left leg straight back. Change positions and do the other side.

F. Concentrate on Lower Extremities

1. Waist to chest deep water start by holding to the wall progress to standing away from the wall using hand buoys as balance support.

    a. Squats - Face the pool wall, hold to the edge for balance. Place feet shoulder width apart. Heels should remain on the pool bottom. Toes facing forward. Lower the body as if you are going to sit. Stop when your knees make your toes disappear. Come back to standing and squeeze the buttocks tightly together. Release and repeat several times.

    b. Hip Flexion - Back to the pool wall, bend knees slightly and maintain spinal alignment, flexed foot. Lift one extended leg up forward. Repeat several times then change to the other leg.

    d. Hip Extension - Face the pool wall, maintain spinal alignment and never arch the back. Slightly lift one extended leg behind you. Repeat several times then change to the other leg.

    e. Hip Abduction/Adduction - Face the pool wall, maintain soft knees and spinal alignment and flexed foot. Lift one extended leg out to side. Repeat several times then change to the other leg.

    f. Knee Flexion and Extension - Back to the pool wall, bring one knee up in front, the hip will be flexed at 90 degrees. Maintain this position while extending and flexing the knee. Repeat several times then change to the other leg.

    g. Hamstring Curl - Face the pool wall, maintain spinal alignment. Alternate lifting each foot toward buttocks.

    h. Ankles Circles - Make a circle with one foot, toes relaxed. Repeat in the opposite direction and with the other foot.

    I. Ankle Flexion/Extension - Point toes up and then down while keeping the knee bent. Repeat with the other foot.

G. Lower Extremity Stretch Exercises - Hold for 15-30 Seconds:

1. Low Back Stretch - Back to wall, maintain spinal alignment, bring one knee up toward chest, placing you hands under the thigh, gently pull knee toward the chest, hold. Repeat to the other side.

2. Quad Stretch - Face pool wall, hold with one hand for balance. Extend the other hand behind you, stretch to touch you opposite heel while bending the knee and bring the heel back towards the extended hand. (Do not force to reach, wave at the heel if you can not touch it.) Repeat on the other side.

3. Calf Stretch - Stand facing pool wall with one leg in front of the other. Press the back heel down toward the pool floor, hold. Repeat on the other side.

H. Face and Neck Exercises:

1. Look Surprised, Happy, Sad, Frown

2. Pretend to yawn open mouth wide. If you pretend well your eyes will start to tear. This is good!

3. Say the vowels aloud - Take a.breath and say the vowel while exhaling Example:
   Take a breath, "AAAAAAAAA", Take a breath, "EEEEEEEEE" ...

4. Neck Rotation with Eyes Wide - Turn you head and look over your shoulder while keeping your eyes very wide open. Hold for 3 seconds. Turn to center and repeat to the other side.

5. Neck Lateral Flexion - Tuck chin and slowly lower head toward right shoulder as if to touch ear lobe to shoulder. Hold for 3 seconds. Slowly return and repeat toward the left shoulder.

6. Chin Tucks - Pull your chin back as if to make a double chin. Hold for 3 seconds. Repeat several times.

L. Hand Exercises:

1. Spread fingers/Make a fist

2. Touch tip of thumb to the tip of each finger

3. Play the Piano

4. Bring the Thumb to the base of the little finger

IX. INEXPENSIVE AQUATIC EQUIPMENT

1. Stabilization Bar - to assist balance while water walking.
2. Hand Buoys - to add resistance during upper extremity and trunk exercises and also used to assist balance during lower extremity exercises.
3. Kick Boards - used to challenge standing and sitting balance and as added resistance during waist exercises.
4. Noodles - May be used as added resistance for some exercises and as flotation for relaxing.
5. Balls 10 " in diameter - May be used as added resistance for some waist and arm exercises also used for hand exercises and balance games.

X. MONITORING RESPONSE TO AQUATIC EXERCISE:

For client motivation and education or research purposes consider these land assessment tests. The Life Span Project A Physical Assessment Study Benefiting Older Adults, Dr. Jessie Jones and Dr. Roberta Rikli California State University, Fullerton. These tests are easy to administer and will measure changes in shoulder flexibility, hamstring flexibility, upper body strength and endurance, lower body strength and endurance, cardiovascular endurance and physical mobility. We also recommend including the Functional Reach test, a measure of balance, (Duncan, P.W., Weiner, D.K., Chandler, J., & Studenski.) Consider administering these tests before an aquatic program begins and periodically throughout the program.

For more detailed information on testing, please contact Ann O'Nihill listed at the beginning of this protocol. Ann is interested in collecting data to provide further evidence on the benefits of aquatic exercise for the PD client.

XI. SERENDIPITY:

An aquatic group will often form an esprit de corps and become a mini support group. Sharing of life histories and disease coping strategies can be as emotionally helpful and morale boosting as the aquatic exercises are physically beneficial.

Increased social contacts, exchange of information, ideas for fund-raising, political action, offers of gratis professional expertise, and joyous laughter have all been unexpected gifts and sources of strength for all of our classes.

We anticipate with calm expectant spirits and hope-filled hearts the new aquatic horizons awaiting us just over the next wave.

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Life Span Project A Physical Assessment Study Benefiting Older Adults, Dr. Jessie Jones & Dr. Roberta Rikli, California State University, Fullerton

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Aquatics for Special Populations
YMCA Program Store
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(217) 351-5077

Center for Disease Control (CDC)
U.S. Department of Health and Human Services
1600 Clifton Road
Atlanta, GA 30333
(404) 639-2317
www.cdc.gov.

National Spa & Pool Institute
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www.nspi.org

National Swimming Pool Foundation
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www.epa.gov

WEBSITES:

AEA
Aquatic Exercise Association
www.aeawave.com

AMERICAN RED CROSS
www. redcross.org

ATRI
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APDA Information and Referral Centers

Please contact the nearest I & R Center for information regarding Support Groups and Chapters or call the National Office at 1-800-223-2732 You can also dial the toll free number 1-888-400-2732 to contact the I & R Center closest to you.

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Hillcrest Medical Center System
800-364-4450
918-747-3747

Pennsylvania, Erie
Health South Rehabil. Hospital
814-456-4210

Pennsylvania, Philadelphia
Crozer-Chester Medical Ctr.
610-447-2911

Pennsylvania, Pittsburgh
Allegheny General Hospital
412-441-4100

Rhode Island, Pawtucket
Memorial Hospital of RI
401-729-3165

Tennessee, Memphis
Methodist Hospital
901-516-0531

Tennessee, Nashville
Centennial Medical Center
800-493-2842
615-342-4635

Texas, Bryan
St. Joseph Reg. Rehab. Ctr.
979-821-7523

Texas, Dallas
Presbyterian Hospital of Dallas
800-725-2732
214-345-4224

Texas, Lubbock
Covenant Hospital
800-687-5498
806-785-2732

Texas, San Antonio
The University of Texas HSC
210-567-6688

Utah, Salt Lake City
University of Utah, School
of Medicine
801-585-2354

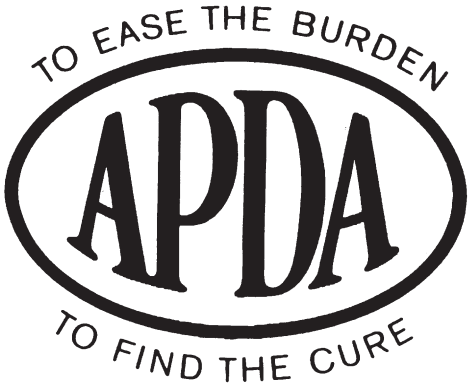
Vermont, Burlington
Univ. Of Vermont Med. Ctr.
888-763-3366
802-847-3366

Virginia, Charlottesville
Univ. of Virginia Medical Ctr
434-982-4482

Washington, Seattle
University of Washington
206-543-5369

Wisconsin, Neenah
The Neuroscience Group of
Northeast Wisconsin
888-797-2732
920-725-9373

Dedicated Centers
* Young Parkinson
**Armed Forces Veterans



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